Remarks: General

The claims have been amended by canceling Claim 28.

If any fee is required to authorize or obtain consideration of this amendment, please charge such fee to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

Claims 1~17, 24~27, 29~39 and 54~82 remain active in the application. Applicant hereby requests reconsideration and further examination of the application in view of its request that the case be forwarded to the Board of Patent Appeals and Interferences with a favorable recommendation for the declaration of an interference with US 6,436,221

Respectfully submitted,

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I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office on February 28, 2005.

Date: February 28, 2005

John A. Langworthy

Appendix A
Current status of all claims

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1. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter;

(b) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(c) separating said material from said electron field emitter.

2. (previously presented) The process of Claim 1 wherein, when said material is separated from said electron field emitter, a portion of said electron field emitter is removed.

3. (original) The process of Claim 2 wherein said acicular emitting substance is acicular carbon.

4. (original) The process of Claim 3 wherein said acicular carbon is comprised of carbon nanotubes.

5. (original) The process of Claim 4 wherein said carbon nanotubes are single wall carbon nanotubes.

6. (original) The process of Claim 5 wherein said single wall carbon nanotubes are laser ablation grown single wall carbon nanotubes.

7. (previously presented) The process of Claim 3 wherein said acicular carbon is comprised of carbon fibers grown from the catalytical decomposition of carbon-containing gases over small metal particles, each of which said fibers has graphene platelets arranged at an angle with respect to the fiber axis so that the periphery of said carbon fiber consists essentially of the edges of said graphene platelets.

8. (original) The process of Claim 5, wherein said carbon nanotubes are less than about 9 wt % of the total weight of said electron field emitter.

9. (original) The process of Claim 5, wherein said carbon nanotubes are less than about 5 wt % of the total weight of said electron field emitter.

10. (original) The process of Claim 5, wherein said carbon nanotubes are less than about 1 wt % of the total weight of said electron field emitter.

11. (original) The process of Claim 5, wherein said carbon nanotubes are about 0.1 wt % to about 2 wt % of the total weight of said electron field emitter.

12. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising

(a) attaching particles of an acicular emitting substance to a substrate to to form said electron field emitter; and

(b) applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter such that said force fractures said electron

field emitter thereby forming a new surface of said electron field emitter.

13. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter;

(b) applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter wherein said force results in the removal of a portion of said electron field emitter thereby forming a new surface of said electron field emitter.

14. (original) The process as in Claims 12 or 13, wherein the acicular emitting substance is acicular carbon.

15. (original) The process of Claim 14 wherein said acicular carbon is comprised of carbon nanotubes.

16. (original) The process of Claim 15 wherein said carbon nanotubes are single wall carbon nanotubes.

17. (original) The process of Claim 16 wherein said single wall carbon nanotubes are laser ablation grown single wall carbon nanotubes.

18~23. (withdrawn)

24. (previously presented) An electron field emitter comprised of an acicular emitting substance wherein the emission of said acicular emitting substance has been improved by the process of Claims 1, 12, 13, 60, 61, 62, 63, 64, 65, 66, 67 or 68.

25. (previously presented) An electron field emitter comprised of acicular carbon wherein the emission of said acicular carbon has been improved by the process of Claim 3.

26. (previously presented) An electron field emitter comprised of carbon nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

27. (previously presented) An electron field emitter comprised of single wall carbon nanotubes wherein the emission of said single wall carbon nanotubes has been improved by the process of any one of Claims 5 or 8-11.

28. (canceled)

29. (original) An electron field emitter comprised of acicular carbon wherein the emission of said acicular carbon has been improved by the process of Claim 14.

30. (original) A field emission triode with an electron field emitter comprised of an acicular emitting substance wherein the emission of said acicular emitting substance has been improved by the process of Claims 1, 12 or 13.

31. (original) A field emission triode with an electron field emitter comprised of acicular carbon wherein the emission of said acicular emitting substance has been improved by the process of Claim 3.

32. (original) A field emission triode with an electron field emitter comprised of carbon nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

33. (original) A field emission triode with an electron field emitter comprised of single wall carbon nanotubes wherein the

emission of said single wall carbon nanotubes has been improved by the process of any one of Claims 5 or 8-11.

34. (original) A completely screen-printed field emission triode with an electron field emitter comprised of an acicular emitting substance wherein the emission of said acicular emitting substance has been improved by the process of Claims 1, 12 or 13.

35. (original) A completely screen-printed field emission triode with an electron field emitter comprised of acicular carbon wherein the emission of said acicular emitting substance has been improved by the process of Claim 3.

36. (original) A completely screen-printed field emission triode with an electron field emitter comprised of carbon nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

37. (original) A completely screen-printed field emission triode with an electron field emitter comprised of single wall carbon nanotubes wherein the emission of said of single wall carbon nanotubes has been improved by the process of any one of Claims 5 or 8-11.

38. (original) A lighting device with an electron field emitter comprised of carbon nanotubes wherein the emission of said carbon nanotubes has been improved by the process of Claim 4.

39. (original) A lighting device with an electron field emitter comprised of single wall carbon nanotubes wherein the emission of said of single wall carbon nanotubes has been improved by the process of any one of Claims 5 or 8-11.

40~53. (withdrawn)

54. (previously presented) The process of Claim 1 wherein the electron field emitter is rearranged, and little or none of the electron field emitter is removed.

55. (previously presented) The process of Claim 4 wherein said carbon nanotubes are multiwall carbon nanotubes.

56. (previously presented) The process of Claim 5 wherein said carbon nanotubes comprise multiwall carbon nanotubes.

57. (previously presented) The process of Claim 12 or 13 wherein said acicular emitting substance comprises multiwall carbon nanotubes.

58. (previously presented) The process of Claim 16 wherein said carbon nanotubes comprise multiwall carbon nanotubes.

59. (previously presented) The process of Claim 12 or 13 wherein said carbon nanotubes are less than about 9 wt % of the total weight of said electron field emitter.

60. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter;

(b) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter, wherein there is no translational motion by said material with respect to the electron field emitter, and wherein said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(c) separating said material from said electron field emitter.

61. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter;

(b) contacting a liquid material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter, and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(c) separating said material from said electron field emitter.

62. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising:

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter;

(b) contacting a material with said electron field emitter before said electron field emitter is fired, wherein said material forms an adhesive contact with said electron field emitter, and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(c) separating said material from said electron field emitter.

63. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, consisting essentially of:

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter;

(b) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter, and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(c) separating said material from said electron field emitter.

64. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter; and

(b) applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter, before said electron field emitter is fired, such that said force fractures said electron field emitter thereby forming a new surface of said electron field emitter.

65. (previously presented) A process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter; and

(b) applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter, before said electron field emitter is fired, wherein said force results in the removal of a portion of said electron field emitter thereby forming a new surface of the electron field emitter.

66. (previously presented) In the fabrication of electron field emitters comprised of an acicular emitting substance, a process for improving the field emission of the electron field emitter comprising:

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter;

(b) contacting a material with said electron field emitter, wherein said material forms an adhesive contact with said electron field emitter and said adhesive contact provides sufficient adhesive force when said material is separated from said electron field emitter so that a portion of said electron field emitter is removed or rearranged thereby forming a new surface of said electron field emitter; and

(c) separating said material from said electron field emitter.

67. (previously presented) In the fabrication of electron field emitters comprised of an acicular emitting substance, a process for improving the field emission of the electron field emitter, comprising

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter; and

(b) applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter such that said force fractures said electron field emitter thereby forming a new surface of said electron field emitter.

68. (previously presented) In the fabrication of electron field emitters comprised of an acicular emitting substance, a process for improving the field emission of an electron field emitter comprised of an acicular emitting substance, comprising

(a) attaching particles of an acicular emitting substance to a substrate to form said electron field emitter; and

(b) applying a force to the surface of said electron field emitter in a direction essentially normal to the plane of the electron field emitter wherein said force results in the removal of a portion of said electron field emitter thereby forming a new surface of the electron field emitter.

69. (previously presented) The process of Claim 60, 61, 62, 63 or 66 wherein, when said material is separated from said electron field emitter, a portion of said electron field emitter is removed.

70. (previously presented) The process of any one of Claims 60~68 wherein said acicular emitting substance is carbon nanotubes.

71. (previously presented) The process of Claim 70 wherein said carbon nanotubes are single wall carbon nanotubes.

72. (previously presented) The process of Claim 71 wherein said single wall carbon nanotubes are laser ablation grown single wall carbon nanotubes.

73. (previously presented) The process of Claim 70 wherein said carbon nanotubes are multiwall carbon nanotubes.

74. (previously presented) The process of Claim 71 further comprising multiwall carbon nanotubes.

75. (previously presented) The process of Claim 70 wherein said carbon nanotubes are less than about 9 wt % of the total weight of said electron field emitter.

76. (previously presented) The process of Claim 1, 60, 62, 63 or 66 wherein the material is applied in liquid form.

77. (previously presented) The process of Claim 61 wherein the material is applied in liquid form and is heated.

78. (previously presented) The process of Claim 76 wherein the material is applied in liquid form and is heated.

79. (previously presented) The process of Claim 1, 60, 61, 62, 63 or 66 wherein the material is thermally softened polymer film.

80. (previously presented) The process of Claim 79 wherein the material is selected from the group consisting of an acrylic film, an ethylene/acrylic elastomer film, a block copolymer film and an ionomer film.

81. (previously presented) The electron field emitter of Claim 24 which has acicular particles protruding from the surface thereof.

82. (previously presented) A process for improving emission current density of a carbon nanotube electron field emitter, said process comprising the steps of:

(a) forming a carbon nanotube layer by screen-printing a carbon nanotube paste through a patterned screen onto a substrate, wherein a plurality of conductive pattern is formed thereon so as to form a field emission display device;

(b) performing a drying process to said substrate;

(c) performing a firing process; and

(d) performing a taping process.